Journal of the Society of Arts.

*FRIDAY, DECEMBER* 31, 1858.

## NOTICE TO INSTITUTIONS.

The Committee of the Society for the Diffusion of Pure Literature have granted to the Council of the Society of Arts the privilege of giving recommendations to the Institutions in Union, enabling them to obtain at half-price libraries of £5 worth and upwards of books, to be selected from a catalogue issued by the Society, and which will be supplied to any Institution applying for it. The principal objects of the Society are to promote the circulation of such books, periodicals, prints, diagrams, and other publications as the Committee may, from time to time, deem really useful and good, whether they are issued by individuals or by Societies.

Institutions desiring to avail themselves of this privilege, should communicate with the Secretary of the Society of Arts.

## EXAMINATIONS, 1859.—LOCAL BOARDS.

The following letter has been received from the Secretary of the Local Board at Louth :—

Mechanics' Institution, Louth, 24th Dec., 1858.

Dear Sir,—I am desired to acquaint you, for the information of the Council, that the Committee have appointed—

The Rev. J. T. Barker, the President of the Institution;
John Bogg, Esq., surgeon;
W. T. Kime, Esq., J.P., barrister-at-law; and
A. T. Rogers, Esq., The Priory;

the Local Board of Examiners for the ensuing year; and to state that, to induce a greater number of young men to enter the lists, they have determined to give a Prize of Thirty Shillings to every candidate from this Institution obtaining a First-class Certificate, and a Prize of Twenty Shillings to every candidate obtaining a Second-class Certificate. The Committee believe that this step will have its intended effect, but they are not in a position at present to say how many candidates they will have.

Yours truly,
B. CROW, Sec. to the Board.

P. Le Neve Foster, Esq.

## SUBJECTS FOR PREMIUMS DURING THE SESSIONS 1858-59 AND 1859-60.

The Council, in issuing the subjoined List of desiderata, would urge upon the Members of the Society generally, and others, the importance of communicating detailed accounts of new processes in Arts or methods of Manufacture, of any modifications by which these may be simplified, or labour saved, and of any novel application of Raw Materials, whether previously known or not, to useful purposes. It is quite possible that some of the things here set down as to be done, may have been already accomplished; but in such cases the knowledge of them is limited. One of the objects of this Society is to elicit discussion on the subjects with which it deals, to see that nothing is concealed which may in any way tend to promote the good of all, and to record facts and opinions. The weekly meetings, and the *Journal of the Society of Arts*, afford the requisite facilities for effecting this, and the Council earnestly hope that the opportunities thus given may be taken advantage of.

*Patented Inventions are not excluded from receiving the Society's rewards.*

The Society is willing to receive communications on subjects not included in the following list, but in all cases expressly reserves the power of rewarding any communication according to its merit, or of withholding the Premium altogether.

The degree of originality and extent of suggestions for improvements will have material influence on the adjudication of the award.

All communications must be written on foolscap paper, on one side only, with an inch and a quarter margin. They must be accompanied by such drawings, models, or specimens, as may be necessary to illustrate the subject. The drawings should be on a sufficiently large scale to be seen from a distance when suspended on the walls of a meeting-room.

In regard to Colonial Produce of all kinds, it is absolutely necessary that a certificate from the Governor, or other qualified person, should accompany the samples sent to the Society, certifying that they really are the produce of the particular district referred to. The samples should be sufficient in quantity to enable experiments to be made, and an opinion to be formed of their quality; and it is desirable that the cost price in the district from which they are forwarded should be given. In every instance the probable extent of supply, with the average yield, if cultivated, and whether similar articles have hitherto been exported from the Colony, or not, and in what quantities, should be stated.

All communications and articles intended for competition must be delivered, addressed to the Secretary, at the Society's House, free of expense, either on or before the 31st of March, 1859, or on or before the 31st of March, 1860. In the first case they will be considered during the Session 1858-59, in the second case during the Session 1859-60. This restriction, as to the date of receipt, does not apply to articles of Colonial produce, in respect of which this list is valid until the 31st December, 1860.

Any communication rewarded by the Society, or any paper read at an ordinary meeting, will be considered as the property of the Society. Should the Council delay its publication beyond

twelve months after the date of its being rewarded or read, the author will be permitted to take a copy of the same, and to publish it in any way he thinks fit.

Unrewarded communications and articles must be applied for at the close of each Session, between the third Wednesday in June and the last Wednesday in July, after which the Society will be no longer responsible for their return.

By order,
P. LE NEVE FOSTER, *Secretary.*
*December*, 1858.

## PREMIUM LIST.

### SPECIAL PRIZES.

#### SWINEY PRIZE (SPECIAL).

Under the will of Dr. Swiney, a silver goblet, of the value of £100 sterling, containing gold coin to the same amount, is presented on every fifth anniversary of Dr. Swiney's death to the author of the best published Treatise on Jurisprudence.

The next award of this prize will be made on the 20th day of January, 1859.

#### THE SOCIETY'S GOLD MEDAL (SPECIAL).

*** A donation by Benjamin Oliveira, Esq., having been placed at the disposal of the Council, to be awarded as a special premium, they have decided to offer the Society's Gold Medal.

For the discovery of a substitute for Cotton, to be produced in such quantities and at such cost as will render it available for commercial and manufacturing purposes.

#### FOTHERGILL PRIZE (SPECIAL).

A GOLD MEDAL.

*** This is offered in conformity with the will of the late Dr. Fothergill.

For the production of an Incombustible Paper, so as to render the ledgers of commercial men, bankers, &c., indestructible by fire.

#### STOCK PRIZE (SPECIAL).

SILVER MEDALLION.

*** This is offered in conformity with the will of the late John Stock.

For a design for an Institute, comprising a hall for lectures and music, two or three class rooms, a reading room, and a library, which must be in one or in communication, offices, and apartments for the librarian. The principal rooms should be so arranged that they may be easily used together for the purposes of exhibition. The plan must be suited for an Institution having two hundred members, and be capable of extension so as to meet the wants of Institutions having 1000 members. Provision must be made for lighting and ventilating the whole of the building. The design must be exhibited in the following drawings, which must be to a scale of $\frac{1}{8}$th of an inch to a foot:—

1. A general block plan.
2. A plan of each floor.
3. At least two elevations.
4. Sections showing the construction of all parts of the building.
5. An estimate of the cost.

N.B.—All the dimensions must be figured on the drawings.

### GENERAL LIST.

*** The Society's gold and silver medals will be awardedfor communications on the following subjects:—

CLASSES I. TO IV.*

1. For an account of the mode of occurrence, and of the uses of Cornish, Devonshire and Dorsetshire Clays, and the quantities annually worked.
2. For an account of the different Natural Stones, whether limestones or sandstones, used for architectural purposes in the different large towns in the United Kingdom, stating the comparative durability, price, special use, and general statistics of each together with suggestions for preventing decay.
3. For an account of the methods at present in use in the various coal-mining districts for ventilating and lighting the mines, with suggestions for their improvement.
4. For an account of the various commercial Copper Ores, of the smelting processes, and the methods by which the precious metals can be separated from Copper.
5. For the application of Silicium economically as an alloy with Copper.
6. For an account of the treatment of Tin, and its application to the Arts and Manufactures, and of recent discoveries of new sources of supply.
7. For an account of the modes by which *Wolfram* can be separated from other ores; and of the uses of Tungsten in the Arts.
8. For any new application of Tungsten in the Arts.
9. For an account of Menaccanite or Iserine, and suggestions for obtaining Titanium from these ores.
10. For an account of the processes now in use for Smelting Zinc Ores, with suggestions for their improvement.
11. For improvements in the process of condensing the Fumes in the Smelting of Lead Slags.
12. For the most ready and economical method of sepating Lead from antimony or antimony ores.
13. For the best account of the production of Sulphur and Arsenic from the metalliferous ores of the United Kingdom, with statistics of the use and export of these substances.
14. For an account of Mineral Veins in the various Mining Districts in the British Islands, with particular reference to the differences that exist between Copper and Lead lodes, and the relations of Copper with Tin, and of Silver and Zinc with Lead.
15. For an account of the methods now in use for separating Silver from Lead Ores, with suggestions for their improvement.
16. For an account of a new and economic means of producing Aluminium commercially, with suggestions of the purposes to which it may be employed with advantage.
17. For the discovery or manufacture of a new Smokeless Fuel, which shall not occupy more space, or be of greater weight than the fuel now in use; and shall be equal in the amount of heating power, without liability to injure metals in contact with it.
18. For a description of the manufacture of saltpetre, and its preparation for the market in the East or West Indies.
19. For the economical production of Cyanogen Compounds for employment in the Arts, or as manures.
20. For the production of Ammonia or Nitric Acid from their elements, by methods which would admit of practical application.

* The classification of this list is that adopted at the Great Exhibition of 1851.

21. For the best collection of Cinchona Barks, capable of elucidating upon analysis the question of the relative richness in alkaloids of the young and old barks of particular species. Such a collection must be formed in the bark districts of South America. The specimens must be accompanied by pressed and dried flowers, fruits, and leaves of the trees of which the barks are sent. Samples of bark must be of not less than 6 lbs. each.
22. For an account of the processes at present employed for the extraction of Dyes and Colouring Matters from animal, vegetable, or mineral substances.
23. For an account of foreign Dyeing and Colouring Substances, distinguishing those at present used from those generally unknown to Commerce.
24. For an account of the principal Dyes and Dye Stuffs at present employed in the woollen and silk trades, their sources of supply and modes of application.
25. For the production of a good and permanent Purple or Violet Dye for silk and other fabrics, by a process free from injurious effects upon those engaged in its production.
26. For an account of the principal Dyes and Dye Stuffs at present employed in the cotton trade, their sources of supply and modes of application.
27. For the production from coal of Colouring or Dyeing Materials, capable of being used economically as substitutes for indigo or madder.
28. For an economical means of increasing the purity and illuminating power of Coal Gas, and for a simple method of detecting and removing the sulphur compounds not shown by the usual Salts of Lead test.
29. For an Elastic Material for Tubing suited to the conveyance of Gas, and not liable to be affected by alterations in temperature, or to be acted upon by the gas itself.
30. For an economical means of supply and application of hydrogen gas for heating purposes.
31. For the best means of Utilizing Refuse Ores, Refuse Coal, and impure approximations to coal.
32. For the discovery of a practical means of utilizing Naphthaline.
33. For the discovery of a practical process for converting the refuse Naphthaline of Gas Works into Alizarine or Madder red.
34. For an account of the processes employed in obtaining different products (as Paraffine) from Shale, and the uses to which they may be applied.
35. For the best account of Coal, Shale, and other Mineral Oils applicable to illuminating purposes, and the best means of rendering them inodorous.
36. For the production of Glass by the use of the constituents of which the French sands are composed, such Glass to be of a quality equal to that produced from those sands.
37. For an account of the various materials, White Lead, White Zinc, and Carbonate of Barytes, used in the manufacture of white paint, and the advantages and disadvantages of each.
38. For a good and permanent bright green colour suitable for Paperhangings, which shall be free from the objections stated to exist in that prepared from arsenic.
39. For a green colour suitable for use, both in water and oil, which shall be more permanent and generally superior in quality to that known as "Brunswick" green.
40. For the preparation of any Colour, applicable to the japanned surfaces of Papier Maché, that shall be free from the brightness (or glare) of the varnished colours now used, but possess the same degree of hardness and durability.
41. For the production of a Blue similar to Prussian Blue, which either on cotton or otherwise, shall not be attacked by soap, or moderately dilute caustic alkalies, in the cold.
42. For the preparation of light colours to be used in Enamelling or Japanning Slate or Iron, which will stand the action of heat from the fire without blistering or discoloration, and be sufficiently hard to resist scratches.
43. For a cheap substitute for Pitch, Tar, &c., equally impervious to air and moisture, but non-inflammable.
44. For an account of Tanning Substances, distinguishing those at present used from those generally unknown to Commerce.
45. For an account of the materials and methods at present employed in preparing and dressing Skins, and the colours and treatments to which they are submitted in dyeing.
46. For an account of the methods at present practised in France and Russia for dyeing and dressing Morocco Leather.
47. For an efficient means of removing the fatty matters from skins, so as to render them capable of receiving mordants by the ordinary printing process.
48. For an account of the sources of supply of Furs, and of the methods of preparing, dressing, and dyeing them for the market.
49. For the introduction commercially of a supply of Hair for manufacturing purposes, obtained from animals not hitherto resorted to, such as the musk ox, &c.
50. For the best substitute for Horsehair, for stuffing cushions, mattresses, &c.
51. For an account of the sources of supply and processes of manufacture of the various Lubricants employed in working machinery and rolling stock.
52. For an account of the Spices of Commerce, with suggestions in reference to new sources of supply.
53. For the importation into this country of samples of Sugar, not less than 25 lbs. weight each, the produce of the Australian Colonies. Details of the extent of land cultivated, yield of sugar per acre, and cost of production per ton of sugar to be given.
54. For an account of Palms and similar trees which yield meal, saccharine and other juices, fibres, edible fruits, &c., with a statement of the cost and commercial value of their products.
55. For the best esssy on the theory and practice of fermentation, particularly as applied to the art of brewing, with an account of any successful means by which the process of malting may be modified or dispensed with.
56. For an account of the processes employed in the manufacture of Starch, the sources from whence it is obtained, and the purposes to which it is applied.
57. For the largest and best sample of Starch, produced from a non-edible substance, as cheap as any at present in use, and obtainable in large quantities.
58. For the best and most economical means of applying Carbonic Acid Gas to the preservation of Meat.
59. For the production of a perfectly Colourless Copal Varnish, not liable to change or contract, or to injure the colours over which it is applied.
60. For a pure Colourless Oil suitable for Artists, or for a decolorising agent for linseed oil which will leave its other properties unimpaired.
61. For an account of the manufacture of Garancine, as now practised in France, commencing with the best processes for grinding the root to powder; with observations as to the modifications which might be necessary for rendering similar machinery available for grinding Indian Munjeet or Madder.

62. For the production of cheap Purple and Yellow Lakes, of good quality, suitable for carriage-builders, &c., and not liable to fade or change colour.
63. For the discovery of a substitute for wood blocks used by the wood engraver, so as to supersede the necessity of uniting several blocks.
64. For an account of the origin, development, and present condition of the Pearl Fisheries of Ceylon, the Persian Gulf, and the Gulfs of Mexico and Panama.
65. For an account of the Sponge or Coral Fisheries, with suggestions for the development of new sources of supply.
66. For an account giving the results of investigations into the nature and character of the various Woods, the produce of India and the Colonies, with a view to ascertain their value for local use in railways in those countries, as compared with the woods used in Europe; the most effective and economical means of preserving such material, when brought into use, against the destructive effects of extreme heat and moisture, and the ravages of white ants and other insects.
67. For an account of Animal Substances, raw and manufactured, illustrating the natural resources of any one of the following British possessions:—The East or West Indies, Ceylon, Australia, Canada, the Cape Colony, Natal, or New Zealand.
68. For an account of Vegetable Substances, raw and manufactured, illustrating the natural resources of any one of the following British possessions:—The East or West Indies, Ceylon, Australia, Canada, the Cape Colony, Natal, or New Zealand.
69. For an account of Mineral Substances, raw and manufactured, illustrating the natural resources of any one of the following British possessions:—The East or West Indies, Ceylon, Australia, Canada, the Cape Colony, Natal, or New Zealand.
70. For the best treatise on the Commercial Products of the Islands of the Eastern Archipelago, and their facilities and openings for trade.
71. For an economical method of rendering the refuse from Scrolls in making size, and the waste Alkali and filth extracted from rags in process of boiling, available each separately as a manure.
72. For an account of the means at present employed in the utilization of so-called "refuse products" generally.

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CLASSES V. TO X.

73. For the introduction of an economic system of Railway Transit applicable to common roads, so as to connect thinly populated districts with each other, and with the main lines of railways.
74. For the introduction upon common roads and in the streets of Towns of a cheap and effective system of Railways for goods and passengers.
75. For the economical application of Iron in the construction of railways in tropical countries, as a substitute for wood.
76. For the best method of preparing Pure Water for Locomotive Engines, either by distilling or otherwise, so as to prevent incrustation in the boiler, and the necessity for "blowing off," thus saving fuel and time.
77. For an account of the machinery and processes employed in the manufacture of Nails.
78. For an account of the machinery and processes employed in rolling metals into sheets, bars, and rods.
79. For an account of the best machinery for preparing, grinding and dressing Barley and Oats into their respective manufactured constituents, pearl Barley, Groats, &c.,
80. For a cheap and effective machine for cleaning and hulling Rice, so that it may be prepared and shipped at the seat of production in a marketable condition.
81. For an account of improvements in the manufacture and refining of sugar.
82. For an account of improvements in Consuming or Preventing Smoke in Dye Houses and Chemical Works.
83. For the best method of converting precipitated or extracted Sewage Matter into a dry state, valuable for agricultural purposes.
84. For the best and most convenient method of welding together the frame-work and covering of iron vessels for navigation, so as to dispense with bolting and riveting, thereby increasing the strength, diminishing the weight, and increasing the floating power.
85. For a system of light and sound Signals, for use in steam-vessels, to prevent collisions at sea in fog or darkness, and more effective than any hitherto known.
86. For an account of improvements in the construction and arrangement of machinery for spinning and doubling Cotton and other fibrous materials.
87. For an account of improvements in the machinery and processes employed in the Manufacture of Woollen Cloths.
88. For an account of improvements in the Machinery and processes employed in the manufacture of Silk Fabrics.
89. For a mechanical substitute for hand labour in running in the outline to the figures in machine-wrought lace.
90. For the best mode of finishing the edges of machine-made Bobbin Lace (in imitation of pillow lace), so as to supersede the use of the separate pearl edge, usually sewn on.
91. For improvements in machinery for weaving Lace, whereby the outline of the pattern produced shall be worked simultaneously with the production of the fabric, without the intervention of hand labour.
92. For a Bobbin for Silk which shall possess exact uniformity of weight, shall be incapable of being made heavier without detection, and which will not absorb moisture. The material employed must not be liable to chip, or to affect the colour of the silk wound on it.
93. For a Machine to serve as a substitute for hand-labour in cutting the pile of silk Velvets and similar fabrics.
94. For an account of the machinery and processes other than hand-labour employed in the production of Embroidered Fabrics.
95. For a Composition for Feeding-Rollers for Printing Paper Hangings by cylinder machinery, similar in consistency and texture to the gelatine rollers used in letter-press printing, but adapted for working in water colours.
96. For an account of improvements in the modes of printing, including the manufacture of Types, Stereotyping, and Printers' Plant in general.
97. For a rapid means of reproducing Artistic Designs or Sketches, without the intervention of hand labour, for surface printing by machinery.
98. For an effectual and economical means of producing Steel or Copper Plates or Surface Blocks by the action of Light, Electricity, Magnetism, or otherwise.
99. For a rapid means of Reproducing Artistic Designs or Sketches, and also for Reproducing Copper-plate Engravings (from the plate or from the impression) for Surface-printing by Hand-press or Machinery, without the intervention of Hand-labour.

100. For an essay on mechanical and other contrivances for Reducing, Enlarging, Copying, and Reproducing Drawings, Maps, &c.
101. For a portable instrument capable of showing the velocity of movement of fluids in closed pipes, adapted for insertion through a stop cock, and possessing a statical indication.
102. For an instrument which shall be applicable to determine the velocity of sub-aqueous currents at considerable depths, with or without the necessity of being brought to the surface to be read off.
103. For the discovery of any simple and efficient apparatus for detecting and registering impure states of the atmosphere, either in mines or in over-crowded and ill-ventilated buildings.
104. For the discovery of a Galvanic Battery for Electromotive machines and other purposes, capable of producing greater results, and at a cheaper rate than any hitherto known.
105. For the production of an efficient means of carrying out the system of Oceanic Electric Telegraphs between distant countries. The plan must insure perfect insulation, *a minimum* of resistance to the current sent, rapidity of communication, the use of a minimum power, freedom from liability to injurious action either from air or water, and a power of resisting mechanical strains.
106. For the production of a covering for the wires of Electric Telegraphs with a vitreous non-conducting coating, which shall be capable of resisting the ordinary wear and tear of telegraphic lines, atmospheric influences, acids, and sea-water.
107. For the discovery of a natural or artificial substitute for Gutta Percha, possessing, amongst others, the following properties:—It must be insoluble in water, a perfect non-conductor of electricity, as flexible and as easily worked as Gutta Percha, firm at a temperature of 150°, but soft and plastic in boiling water, and weldable at 212°.
108. For any new and simple method of producing works of Art in the compound metal bronze, or other metals, either by improved methods of casting, in the material employed as moulds, or by electro deposit.
109. For the invention of a simple Electrometer, to be sold at a moderate price, for determining the amount and kind of atmospheric electricity; and which will show uniform results under uniform circumstances.
110. For the invention of a Self-registering Electrometer showing the kind as well as the amount of electricity.
111. For a Self-registering maximum or minimum Hygrometer.
112. For the invention of a Marine Mercurial Barometer, which will obviate the oscillation of the mercury, and fulfil all the conditions necessary to make it a good and reliable instrument.
113. For the invention of an Anemometer, for measuring the force and direction of the wind on board ship correctly, distinguishing the amount due to the wind and that due to the ship's velocity, varying with the angle.
114. For a machine that will satisfactorily determine great depths at sea by compression, free from the errors of absorption of air, if that be employed, or from the inequalities of a spring, if that be used; and upon a scale of sufficiently large dimensions throughout to be practically useful and correct.
115. For an instrument that will detect the Local Attraction of a ship at sea with reference to the compass, by direct observation of the heavenly bodies, *without* the process of turning the ship.
116. For an Artificial Horizon that can be practically employed at sea, to be used with a sextant, and which will enable the altitude of a heavenly body to be taken with sufficient accuracy for the purposes of navigation.
117. For a Self-registering Minimum Thermometer for great depths at sea, that will not be deranged by checking and hauling up the line, or by the pressure of the water on the bulb, and that will give the minimum of temperature passed through.
118. For the invention of a Mercurial Self-registering Minimum Thermometer.
119. For a ready means of combining the Practice of Great-circle Sailing with the Principles of Physical Geography.
120. For the production, in a reliable form, of Maps on a spherical surface which will be portions of globes fit to be suspended on walls or laid on a table, or for use on board ship in place of Mercator's charts.

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CLASSES XI. TO XXIX.

121. For the economic production of articles of outer clothing, woven in the loom, so as to economise the cost of production, and reduce the amount of hand labour.
122. For the best specimens of Woollen Velvets and Velveteens, of a moderate price, not liable to fade or become rusty, and especially suitable for the furniture and the interior of carriages.
123. For an account of an improved method of transferring the pattern from the original design to the Jacquard Loom.
124. For an economical means of producing figured patterns in the Loom by means of Electricity.
125. For a means of producing by the electrotype process a gilded pattern or portion of a pattern on textile fabrics, or of gilding the fibre previous to weaving.
126. For the successful application of some new means (as Electricity or Photography, for instance) for producing Ornamental Coloured Designs in Woven Fabrics, which shall be cheaper and easier of application than those at present employed.
127. For the best series of Tinted Writing and Packing Papers coloured in the pulp, made from materials not suited for the manufacture of white paper.
128. For the best method of Colouring Paper in the pulp with indigo, and with greens of various hues, the colours not to be liable to be affected by gases.
129. For a method of more thoroughly Sizing Machine-made Papers with Animal size.
130. For an account of the processes at present used in the re-conversion of Woollen or Mixed Woollen Rags, with specimens illustrative of the manufactures in which they are or may be employed.
131. For an account of the machinery and processes used in cutting, working, and embossing veneers in imitation of carved work.
132. For the best essay on Ancient Goldsmiths' Work.
133. For an account of any new and improved processes for economically producing vitreous reflecting surfaces applicable to Lighthouses, or for general purposes.
134. For an account of the processes and materials employed in Chromatic Painting on Glass, Porcelain, Clay, Lava, and materials susceptible of vitrification, or capable of receiving an enamelled surface.
135. For a chemical means of Engraving on Glass and Crystal, avoiding the injurious fumes of fluoric acid, and producing finely detailed designs.
136. For a Chemical or Mechanical process for fixing or engraving the collodion photographic image on its plate of glass, so that it may be employed ornamentally in windows, &c., or as a matrix for obtaining impressions on paper.

137. For a process for transferring to Porcelain, Photographic images which may be permanently fixed by being burnt in, or enamelled on the surface.
138. For an essay on the manufacture of Earthenware Pipes and Stone Ware in general, with an account of the improvements introduced in the construction of the Kilns used in burning such wares.
139. For an account of the various Artificial Stones and Terra-Cottas introduced and employed for purposes of construction, stating their properties, advantages, and imperfections, and their relative cost as manufactured, both inclusive and exclusive of loss by breakage in the kiln.
140. For the production of Paperhangings printed from blocks by machinery, thereby enabling a larger number of colours and increased surface to be worked economically.
141. For the production of Paperhangings in which effects are economically produced by the action of chemical re-agents in the body of the paper, as is the case in photographic processes and in calico printing.
142. For an account of processes at present employed in the preparation of Artificial Perfumes and Essences.

143. For an essay on Evaporation, Condensation, and Refrigeration, with the results of systematic experiments, and the economical results, both as to time, fuel, and surface, the comparative degrees of heat used and produced, and a comparison of those results with theoretical maxima.
144. For a connected series of practical observations on Natural or Atmospheric Evaporation, as taking place from the surface of cultivated or uncultivated land, and a comparison of the same with the local rainfall.
145. For an essay on the various branches of Industry which are known to be unhealthy, pointing out the causes of their injurious effects, with suggestions for prevention or relief.

## ON ARSENICAL PAPER HANGINGS, AND THE MODE IN WHICH THEY PRODUCE NOXIOUS EFFECTS ON HEALTH.

By ALFRED S. TAYLOR, M.D., F.R.S.

A friend, whose library walls were covered with an arsenical paper, had suffered for some time from chronic inflammation of the eyes, especially affecting the conjunctivæ of the eye-lids. On the discovery that arsenic was contained in the green pigment of this paper in rather large quantity, he caused it to be removed during the summer, and to be replaced by another containing no arsenic. The inflammation from which he had suffered disappeared; but within the last few weeks it has returned. He informed me that he had been dusting some books in a book-case in this room, and he supposed that the dust which had accumulated for two or three years had affected his eyes, and had caused a return of the inflammation. Some of the dust was carefully removed, on Tuesday last, from the tops of a few books, by a feather, and submitted to a chemical analysis. The dust weighed one grain and a half; it had an olive-green colour; and under the microscope it presented the appearance of fibres, with numerous particles of various colours, chiefly of a greyish black. Treated by Reinsch's process, a portion of this dust yielded a deposit of arsenic, and there was therefore clear evidence that some of the arsenical pigment formerly on the walls, had found its way through the glass doors of the book-case, and had been deposited in the form of a fine dust on the tops of the books.

On Thursday last, after having made this chemical examination of the dust from a private dwelling, I procured from the shop of Messrs. Marratt and Short, opticians, 63, King William-street, London-bridge, a quantity of dust for the purposes of analysis. The walls of this shop are covered with an unglazed arsenical paper, and, as I am informed, they have been so covered for a period of three years. In collecting this dust from the tops of the instrument cases, great care was taken not to touch the walls. The quantity thus collected for examination amounted to about four hundred and fifty grains. It was nearly black, and under the microscope it appeared to consist of fibres and sooty particles. It was very light and flocculent. One hundred and fifty grains of the dust were examined by Reinsch's process, and enough metallic arsenic was obtained from this quantity to coat about ten square inches of copper-foil, in addition to a piece of copper-gauze. From the deposit on the latter, by the application of heat, octahedral crystals of arsenic were readily obtained. The cases had not been dusted for a period of nine months.

The instrument cases are secured by glass doors, and they are lined inside at the back with arsenical paper. A small quantity of dust was removed by a camel's hair pencil from the projecting portions of the thermometers and barometers which are kept there. The quantity thus obtained weighed about eight-tenths of a grain, of which five-tenths were taken for examination. This half-grain of dust sufficed to cover with metallic arsenic a square inch of copper gauze; a portion of this, when heated, yielded a large number of well-defined octahedral crystals of arsenious acid.

These facts lead to the inference that the air of a room, of which the walls are covered with an unglazed arsenical paper, is liable to be charged with the fine dust of the poisonous arsenite of copper. Those who inhabit those rooms are exposed to the risk of breathing this dust. The poison may thus find its way by the pulmonary membrane into the system, or it may affect the eyes, nose, and throat by local action. That few cases of actual poisoning, under these circumstances, have occurred, is a fortunate circumstance; but cases involving serious symptoms only would be likely to attract attention. There may have been numerous instances of a disturbance of health, depending on this assenical paper, which, from absence of suspicion, has been referred to other causes. The degree of exposure—the state of health—peculiar susceptibility and the eliminating power of the system may account for the comparative rareness of these cases. The mode in which the pigment is laid on the paper may be such as to prevent, in some instances, the escape of fine particles of dust. The fact, however, now demonstrated, that arsenical dust is breathed by those who occupy rooms thus papered, explains the similarity of symptoms observed,—justifies the statements made by Dr. Hinds, Dr. Halley, and others.—and proves that those who have experimented on this subject with negative results, have not taken the right course to arrive at the truth. Their results have, to a certain extent, misled the public, by teaching them to rely on what is now proved to be a false security. If, as a general rule, the quantity of arsenic which can penetrate the body from this source is small, it is still desirable that arsenic should not be breathed day by day in any proportion. The defenders of this noxious manufacture will hardly go the length of asserting that this arsenical green, which is a potent poison in the stomach, can exert no injurious effect when taken into the lungs; and yet, unless this assumption be made, the inevitable inference is that these papers should not be used for covering the walls of our dwellings.

15, St. James's-terrace, Regent's-park,
December 29, 1858.

## WIGAN MINING AND MECHANICAL SCHOOL.

A school is to be opened for the purpose of giving the colliers, operatives, and others of the working classes, in the town of Wigan and the district, the means of acquiring elementary scientific instruction, more particu-

larly in those subjects immediately bearing upon local industry.

This will be done by means of classes, held in a room at the Mechanics' Institution, which has been fitted up for the purpose, and where an extensive collection of chemical and mechanical apparatus, together with the models of steam engines, and other machines, has been provided for the use of the scholars. The master of the school has been selected by the Government Department of Science and Art, and has a certificate from the School of Mines in London.

All candidates must be fifteen years of age, and must be able to read and write, and know the simple rules of arithmetic. Those who require to be taught these subjects, may learn them by becoming members of the evening classes of the Mechanics' Institution.

The course of instruction in the Mining and Mechanical School will extend over one year, and will embrace the following subjects:—

MINING.

1.—Detailed discussion of known facts connected with the deposits of coal and cannel, and other minerals, beds, strata, or seams, faults, &c.

2.—Preliminary research; boring, as practised with different apparatus, with rods or rope, and with various cutting and clearing instruments.

3.—Tools employed in mining—blasting by various methods.

4.—Mode of lighting mines, including a comparison of the various sorts of safety lamps.

5.—Shafts and levels—sinking and driving.

6.—Means of securing excavations by timbering, masonry, and tubbing; construction of dams.

7.—The getting and working of the minerals.

8.—Carriage and transport of minerals by underground roads.

9.—Winding or raising in the shafts, with the machinery and apparatus required.

10.—Pumps and pumping engines.

11.—Ventilation, its principles and practice; natural ventilation, artificial, introduction of a moving power, distribution of air through workings, explosions, and the mode of detecting and dispelling noxious gases.

12.—The making of colliery plans, and the use of the dial and level.

THE PRINCIPLES OF GEOLOGY AND MINERALOGY.

MECHANICS.

1.—Lectures on heat, electricity, the telegraph, and mechanical powers.

2.—Applied—the principles of the above being shown in their relation to the steam-engine, boilers, and machinery, and illustrated by working models.

3.—Mechanical drawing.

CHEMISTRY.

Theoretical—by means of lectures, in which attention will be called to the abstract discoveries of the science, and also to the condition of water supply for domestic purposes, purification of water, gunpowder, bleaching powders, and dyeing, mortar and cement. The manufacture and purification of coal gas. Particular attention will also be directed to the different gases, especially those met with in coal mines.

The classes meet on Monday, Tuesday, Wednesday, and Friday evenings, from 7 o'clock to 9, the terms being 6d. a-week; members of the Mechanics' Institution are admitted at half-price.

The course commences on the 1st March, 1859, but preparatory lectures, on mechanics, chemistry, and arithmetic are now being given.

## GEOLOGISTS' ASSOCIATION.

A meeting was held at Messrs. Barton's rooms, in Upper Wellington-street, Strand, on Friday evening, December 17, for the purpose of organising a new society, to promote the study of geology and its allied sciences. The means proposed are—the holding of periodical meetings for reading and discussing papers, and the exhibition of specimens; arrangements for facilitating the exchange of specimens between distant members; the formation of a typical collection of fossils suited to the wants of students; a library of reference; and the delivery of short courses of lectures. It was announced in the course of the proceedings that 120 applications for membership had already been received. The first meeting for actual work will take place early in the new year, when more detailed plans will be stated, and an inaugural address delivered by the president.

## NEW WEIGHTS.

The *Liverpool Albion* states that the new weight, equal to 100lb. avoirdupois, to be called the "Cental," will be adopted exclusively for all transactions in the Liverpool Corn-market on and after the 1st of February next, all other weights, except for minor portions of the "cental," and all measures of every kind whatever, being from that date excluded. At Hull, likewise, it has been resolved to adopt the "cental," not only for all grain, flour, and meal, but for seeds also; and Wakefield and Leeds are expected to concur in the movement.

# Home Correspondence.

## THE SUPPLY OF COTTON.

SIR,—Mr. Clegg, the chairman of the late meeting on the Cotton Paper of Mr. Wray, seems to possess more common sense, as well as humanity, than the generality of his townsmen. He imported Africans to work in his mills. The history of how this was set about would be very interesting to all the readers of this Journal, and also what the results were, whether the African fingers were as well-adapted to cotton as those of the ordinary mill-workers, whether they were diligent, industrious, and well-conducted, and whether they earned wages, and what amount, and whether it would not pay mill-owners generally to import them and then let them go back to their own country to spread civilisation, perhaps ultimately to set up mills with English machinery, as well as to grow cotton. If this could be done, it would rapidly set the Americans to work to supersede the use of slaves by machinery. I can conceive nothing more desirable or more likely to aid civilisation all over the world than the importation of the natives of all countries into England to behold with their own eyes the results of freedom and industry. And Africa, especially, is so close to our own doors that our teaching can be done to our own profit, and in time an allied nation may grow up prepared to aid us in our continuous struggle for their freedom, and to close the door against the domination of taskmasters, importing them to the tropics—another name for slavery. I trust that Mr. Clegg will let us know that he means to introduce more Africans, for no one would suppose that bringing Africans to England has any tendency to make their condition worse, but on the contrary. We hold the best part of Africa as a colony on the south. Dr. Livingston is founding a new colony in Central Africa, and doubtless time will show how the Atlantic coast is to be drained and made wholesome, or, at least, how we may safely pass through the coast-poison at all times to the interior. Very valuable to the community is the work doing by the Society of Arts. But for this, we should now be lacking the important knowledge we have obtained from Mr. Clegg and Mr. Wray.

I am &c., W. BRIDGES ADAMS.

## MR. REED'S PAPER ON THE SHIPS OF THE ROYAL NAVY.

SIR,—In common with all those who have either read or heard read Mr. Reed's valuable paper on the "modifications which the ships of the Royal Navy have undergone during the present century, in respect to form, dimensions, means of propulsion, and powers of attack and defence," read at the Society's meeting of the 15th inst., I beg leave to join in the thanks awarded to Mr. Reed by the Society. I am not surprised that amongst the numerous topics therein mentioned, Mr. Reed should have omitted the dates of several important facts, and the names of those to whom the introduction of certain improvements into the Royal Navy is due. In order to supply some of these omissions, I beg leave to make the following observations:—As far back as the year 1790, the late Mr. Rennie entered into correspondence with the late ingenious Earl Stanhope, pointing out how the improved patented steam-engine of Watt could be applied in the most advantageous manner for the propulsion of vessels, either by the cylinder being placed vertical, horizontal, or inclined. In 1818, he recommended the corporation of Edinburgh to adopt steam vessels for towing, or that they might be constructed for the double purpose of towing and dredging if required. Long previous to this, Mr. Rennie had constantly urged upon the Admiralty the absolute necessity of introducing steam vessels into the Royal Navy; but, although the late Lord Melville, then first Lord of the Admiralty, was fully convinced of the importance of the invention, and the propriety of following Mr. Rennie's advice, nevertheless the prejudices and opposition of the officers under him were so strong that he was for a while obliged to defer to them. At last Mr. Rennie prevailed upon his lordship to permit him to hire a steam vessel to tow one of His Majesty's vessels of war, being fully convinced that the result would overcome all objections. This memorable experiment took place on the 4th of June, 1819, under the direction of Mr. Rennie in person, accompanied by the late Mr. Oliver Laing, afterwards master-shipwright of Woolwich dockyard, whom Mr. Rennie had imbued with the same enthusiasm for steam-vessels as himself. The vessel selected to be towed was the *Hastings*, of 74 guns, and the towing steam-vessel was the *Eclipse*, a Margate steam-boat, one of the first. This vessel was 117 ft. long, 21 ft. wide, and drew 4 ft. 10½ in. water. The paddle-wheels were 16 ft. diameter, and 6½ ft. wide, and were worked by a pair of steam-engines of the nominal power of 30 horses each, or 60 horse-power together. Mr. Rennie gave the result of this trial in a long detailed report to the Admiralty, showing that the *Hastings* was towed by the above-made steam-vessel fully four miles an hour against tide, *by steam alone*. In other respects the experiment was most satisfactory, and convinced everybody present of the importance of the invention, and the absolute necessity for introducing steam-vessels without delay into the Royal navy. The *Hastings* was towed from Woolwich Dockyard to Gravesend church, and would have been towed to Sheerness, but the proprietors of the steam-vessel would not go lower down, as it would have interfered with their business on the Margate station. This may fairly be considered the first introduction of steam into the Royal Navy. The Admiralty then determined to construct a steam-vessel for their navy, and Mr. Laing was employed for that purpose. The result of this was the *Comet*, in 1820, in the construction, general dimensions and power of which Mr. Rennie's advice was in a great measure adopted. The *Comet* therefore, may properly be considered the first steam-vessel belonging to the Royal Navy. Mr. Rennie died in 1821. Had he lived there is very little doubt but that the progress of steam in the Royal Navy would have been more rapid, as he was very enthusiastic upon the subject, and his advice was listened to with great respect.

In 1837, in consequence of the success of Mr. T. P. Smith's screw-propelled vessel, a company was formed to carry the invention into effect upon a large scale; and my brother, the present Mr. Rennie, and myself, being fully impressed with the importance of the invention, and that it would of necessity ultimately supersede the paddle-wheel, at least for vessels of war, subscribed largely to the company, and constructed the steam-engines and machinery for the *Archimedes*, 232 tons, and 125 ft. long, 21 ft. 10 in. beam, and draught of water about 9 feet. The engines were in some measure direct-acting, and of 80 h.p. The propeller shaft was driven by gear, and made 133·3 revolutions per minute. The propeller was 5ft. 9 in. diameter, and 8 ft. pitch, and propelled the vessel through water nine miles an hour. The complete success of the *Archimedes* took the mechanical world by surprise, although considerable doubts and difficulties as to its ultimate success were expressed in many quarters. My brother and myself had no doubt whatever upon the subject, and determined to proceed in urging it forward by every means in our power. The *Archimedes* was completed in the summer of 1839. Soon afterwards I waited upon Sir George Cockburn, then senior Naval Lord of the Admiralty, and pointed out to him, in the strongest manner possible, the advantages of stern propelling, and the absolute necessity of introducing it into the Royal Navy without further delay, as it must of necessity supersede the paddle-wheel in vessels of war.

Sir George Cockburn listened with the greatest attention to all I said, and at first expressed considerable doubts as to its success. At last, in the name of my brother and myself, I offered to provide a vessel of a certain size, propelled by a screw, with engines and machinery complete, capable of carrying a suitable armament with a corresponding crew, provisions, and munitions of war, which should have a speed of ten knots an hour *through the water*. No money was to be advanced or paid until the proposed conditions had been strictly fulfilled, and the price to be paid was then to be determined by the Admiralty officers, and if the Admiralty did not approve of her, we would take the vessel back without any charge. The confidence with which the proposal was made, and the fairness of terms, at once struck Sir George Cockburn as an omen of success; his doubts vanished, and at his recommendation the proposal was at once accepted by the Admiralty. The result was the completion of the *Dwarf*, in 1840, 210 tons, with engines of 120 h.p., in some measure similar to, but an improvement upon, those of the *Archimedes*, propelled by a screw of the requisite size. The *Dwarf* attained a speed of fully 12 miles an hour, which was more than we promised; she proved herself to be an excellent sea-boat, and fully answered every expectation, and was of great use as a dispatch boat between England and Ireland during the stormy and eventful winter of 1840-41, when the O'Connell rebellion was threatened. This was, I believe, the first introduction of the screw into the Royal Navy. Its subsequent success needs no comment, but more than amply justifies all the arguments we used in favour of its introduction. The late scientific Admiral, Sir David Milne and myself, some short time afterwards, proposed to apply the screw to line-of-battle-ships and floating batteries for the protection of harbours; this was subsequently carried into effect, and now the triumph of the screw may be said to be almost universal.

I am, &c.,

JOHN RENNIE.

London, 27th Dec. 1858.

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SIR,—In the discussion which followed the reading of Mr. Reed's valuable paper on Wednesday, there hardly seemed to be a proper opportunity to notice one point which appears worthy of some remarks.

The progress made in our own navy, and the comparison between the navies of different countries at the present time, cannot be accurately understood so long as the capacities of ships-of-war are indicated merely by

the number of guns, horse-power of engines, and tonnage of the vessels, as these elements are calculated or given by mere haphazard now-a-days. It is extraordinary that men will continue to compare the tonnage of vessels, as if a proper standard were actually in use, when it is generally acknowledged that the engine power and tonnage capacity are both estimated by a calculation wholly illusory. The committee lately re-appointed by the British Association on this subject (with modified objects and powers) will probably recommend some better means for estimating the relative strength of navies, but meanwhile there is actually no reliable criterion of the tonnage of men-of-war (omitting the engine power for the present), and we find that all international comparison is accordingly deceptive.

For instance, the Turkish ships destroyed at Sinope included several of enormous tonnage (as reported); and yet I recollect when visiting these vessels before the battle, that several were obviously overrated a hundred per cent. It was *convenient* for the Turks to say they were of 4,000 tons register.

Again, a large Russian vessel was launched a few months ago at New York, and I found the Americans who built her published her tonnage at 6,000. It was then *convenient* for her builders to proclaim the enormous size of this vessel, the *General Admiral*, and yet her dimensions, when carefully compared with her nominal capacity, seemed to be strangely at fault. The American *Niagara* is often stated to be 5,000 tons register, but a comparison of her actual dimensions with those of the steamer *Persia*, of the Cunard line, makes one nearly sure that the *Persia* is decidedly superior in capacity, as she certainly is in power and speed.

Again, the Russians in America published an account of the Russian vessel refitting at Bordeaux, from which one might suppose she was almost a *Leviathan;* yet an inspection of the hull itself in the French port showed me that the description was grossly exaggerated.

Here, then, we have Turks, Russians, and Americans all publishing inaccurate statements, and perhaps "Britishers" also do the same. This practice will never be discontinued until some of the great nations, if not all of them, agree to estimate the tonnage of vessels according to a proper standard.

With respect to the steam-ram prodigy now building in New York, I may be allowed to confirm Mr. Scott Russell's statement, by mentioning that the slightest allusion to this affair is received in New York with a good-humoured smile, and that shrug of the shoulders which pantomimes the word "job."

We are evidently, therefore, in great need of some improved method of measuring the capacities of large vessels as a recognised standard upon which international comparisons may be based. And there is almost as much required in relation to the weight of metal which each ship-of-war really possesses, the number of tons of iron which could be discharged in a certain time, with a certain range.

One of the most valuable merits of Mr. Reed's paper deserves to be particularly noticed, as it was no doubt peculiarly remarkable, and that is the fairness with which praise was bestowed in it upon Government proceedings when they are good, while the shortcomings of official doings were also freely blamed.

I am, &c.,
JOHN MACGREGOR.

Temple, Dec. 17, 1858.

## Proceedings of Institutions.

DORKING LITERARY AND SCIENTIFIC INSTITUTION.—A lecture on "Aquaria and Vivaria, regarded as Educational Instruments in Natural History," was delivered on Friday evening, the 3rd inst., by Samuel Highley, Esq., F.G.S., F.C.S. &c., vice-president; George Cubitt, Esq., vice-president, in the chair. The lecturer commenced by alluding to his desire, on taking up his residence in the neighbourhood, to found, with the assistance and co-operation of the gentlemen of the district, a Local Museum of Natural History, in connection with the Dorking Literary and Scientific Institution—that a separate fund had been established for the support of the Museum, which had already been liberally contributed to by the president and some of the vice-presidents, and that specimens and collections were pouring in so that an extension of the cases was already a matter of necessity. After pointing out the value of Museums to towns, he stated that the lecture might be regarded as the first of a series of occasional demonstrations on the contents of the Museum, and that his object would be to impart to his hearers sound and complete information on the subject under consideration, and that, beginning with the more elementary objects in the Museum, he intended gradually to lead upwards to the higher branches of natural history. As honorary director of the local Museum, he proposed making a general feature of Aquaria and Vivaria. He described the various forms of Aquaria, pointing out what plants, animals, &c., should be employed in maintaining the necessary balance of organic nature, both in marine and freshwater Aquaria, and the various precautions to be observed in their proper management, especially referring to the influence and stimulating power of light on vegetable growths, and the necessity of moderating the amount admitted to a much greater extent than was usually done. He then considered Aquaria and Vivaria in their educational relations, and showed, by coloured diagrams, how far representations (or types) of the great divisions of the animal kingdom could be employed to this end. After showing the implements necessary in shore collecting, and the dredges, nets, &c., employed for obtaining the various forms of life found in the sea, he proceeded to describe the kinds of animals to be met with in calm weather and after storms, and in what positions they could best be sought after. The lecturer then recommended his audience to watch the progress of the Aquaria and Vivaria shortly to be placed in the Museum, and concluded by thanking them for their courteous attention to his remarks.—The lecture was attended by a numerous and influential auditory, and many encomiums were bestowed on the beautiful and artistic arrangement by Mr. Highley, of the numerous marine and freshwater Aquaria, Natural History specimens, diagrams and apparatus necessary for the illustration of the subject. A vote of thanks was proposed by the chairman to Mr. Highley, and a like compliment was paid to Mr. Cubitt though Mr. Maybank.

HANLEY (POTTERIES MECHANICS' INSTITUTION).—On Tuesday, 21st instant, Dr. Charles Mackay, the well-known poet, delivered, in connection with this Institution, an interesting lecture on "Popular, National, and Historical Song, and the functions and influence of the Song Writer." The lecturer claimed for songs an important place in the literature of a nation, as moulding its fortunes by the great influence they exert in forming the opinions and character of the people. As notable examples, Dr Mackay quoted the famous song, commencing "And shall Trelawny die?" the English "National Anthem," the "Carmagnole," the "Marseillaise," and others. Burns's song, "A man 's a man for a' that," had, the lecturer said, in his opinion, inculcated, more powerfully than any other composition of the same length, the manly virtues of self-respect and self-reliance. Dr. Mackay closed his lecture by reciting two poems of his own, on the old subject, "ever new," of love. After the lecture, Mr. T. L. Emery, a gentleman of considerable local reputation as a vocalist, gave, with much effect, several of Dr. Mackay's songs, including "There's a good time coming," the audience joining in the chorus.

## To Correspondents.

ERRATUM.—In the *Journal* for December 10th, page 54, col. 2, line 38, for "10 miles an hour" read "one mile an hour."

## MEETINGS FOR THE ENSUING WEEK.

MON. .....Entomological, 8.
TUES. .....Royal Inst., 3. Prof. Faraday, "On Metalline Properties —Strength, Welding, Magnetism, &c."
Pathological, 8.
Photographic, 8.
WED. .....Geological, 8.
Pharmaceutical, 8.
Royal Soc. Lit., 8½.
THURS. ...Royal Inst, 3. Prof. Faraday, "On Metalline Properties —Three States, Alloys, &c."
Royal Soc. Club, 6.
Royal, 8½.
FRI. .....Archæological, 4.
SAT. .....Asiatic, 2.
Royal Inst., 3. Prof. Faraday, "On Metalline Properties —Voltaic Battery, &c."

## PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, December* 24, 1858.]

*Dated 22nd October*, 1858.

2360. E. Whitehall, Bromley-place, Nottingham—Certain imp. in machinery for the manufacture of cap fronts.

*Dated 13th November*, 1858.

2548. J. Taylor, Birkenhead—Imp. in portable steam engines.

*Dated 17th November*, 1858.

2588. M. Scott, 3, Stanhope-terrace, Hyde-park-gardens—Imp. in the construction of breakwaters, parts of which are applicable in making other structures.

*Dated 19th November*, 1858.

2626. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in the construction of electric telegraph cables or conductors. (A com.)

*Dated 27th November*, 1858.

2696. J. Ramsbottom, Accrington, Lancashire—Imp. in machinery or apparatus applicable to water meters, and to indicating and regulating the flow and pressure of fluids generally, and in obtaining motive power from the same.

*Dated 3rd December*, 1858.

2762. T. Bailey, 17, Russell-street, Birmingham—A mechanical movement applicable to loading fire-arms, and other purposes.

2764. G. E. Noone, 28, Hodson-street, Frances-street, Newington Butts—Certain imp. in machinery for generating gas from coal.

2768. C. F. Vasserot, 45, Essex-street, Strand—An improved apparatus for ventilating mines or other similar purposes. (A com.)

2770. H. Bevan, Shrewsbury—New or improved machines for effecting or facilitating arithmetical operations.

*Dated 4th December*, 1858.

2772. R. Legg, 11, Ashby-street, Clerkenwell—A machine for combining the operation of compressing and cutting tobacco during the process of manufacture.

2774. J. B. Fisher and J. Fisher, Stourbridge, Worcestershire, and J. Bird, jun., Kingswinford, Staffordshire—An imp. in the doors and dampers of furnaces, and other places where intense heat has to be resisted.

2776. E. A. Servier, Paris—Imp. in pressure and fluid level indicators.

2778. A. Smith, J. Townsend, and E. W. Williams, Birmingham—An imp. in breech-loading fire-arms.

2780. J. Turner, 8, Lavender-grove, Queen's-road, Dalston—Imp. in the construction of chairs.

2782. J. L. Norton, Belle Sauvage-yard, Ludgate-hill—Imp. in machines for stretching and drying fabrics, and in drying wool and other fibres.

2784. W. E. Newton, 66, Chancery-lane—Certain imp. in grain and grass harvesting machines. (A com.)

2786. T. R. Harding, Leeds—Imp. in combs, gills, hackles, and similar implements used in silk, wool, and flax machinery, and in the method of making the same.

*Dated 8th December*, 1858.

2811. C. de Cappot and A. Jarriant, 10, Route de la Révolte, Neuilly-sur-Seine—A new hydraulic counter.

2813. M. Henry, 84, Fleet-street—Imp. in twisting fibrous materials, and in machinery or apparatus employed therein. (A com.)

2815. A. Lamb and W. A. Summers, Southampton—Improved arrangements of apparatus for superheating steam.

2817. C. M. Westmacott, Arboretum-street, Litchurch, near Derby —Imp. in the permanent way of railways.

*Dated 9th December*, 1858.

2819. R. L. Burrowes and J. Knowles, jun., St. Helens—Certain imp. in the construction of pianofortes and organs.

2821. H. Maudsley, 4, Cheltenham-place, Lambeth—Improved glass and other vitreous vessels.

2823. H. Bell, Belfast, Ireland—Imp. in musical instruments.

2825. J. Elder, Glasgow—Imp. in paddle wheels.

2827. T. Allen, Clifton, Bristol—Imp. in folding bedsteads.

2829. H. Wilson, Norton, Durham—Imp. in the construction of pumps.

2831. B. Lauth, Morley's Hotel, Trafalgar-square—An improved mode of manufacturing rods and shafts.

*Dated 10th December*, 1858.

2833. J. Lightfoot, Accrington, Lancashire—Imp. in printing or staining yarns, fabrics, or fibrous substances, and in the manufacture of certain compounds for that purpose.

2835. A. Barclay, Kilmarnock, N.B.—Imp. in electric, magnetic, and electro-magnetic telegraph ropes or conductors.

2837. C. Hodgson, Ballard Rathdrum, Wicklow, Ireland—Imp. in the manufacture of fuel from peat, and in apparatus employed therein, part of which is also applicable to the moulding of bricks, tiles, and other plastic materials.

2839. G. F. Wilson, Belmont, Vauxhall—Imp. in the manufacture of lubricating oils.

*Dated 11th December*, 1858.

2841. W. F. Hall and T. Dutson, Saint Paul's-square, Birmingham—Certain imp. in fancy buttons for ladies' and gentlemen's wear.

2843. S. Dudgeon, Sheffield—An improved gas regulator.

2845. P. Robertson, Sun-court, Cornhill—Imp. in shuttles. (A com.)

2847. M. Schaffner, Eisenach—Imp. in smelting zinc ores, and in furnaces employed for this purpose.

2849. A. Rollason, Birmingham—Imp. in the manufacture of waterproof tissues, and in applying such waterproof material to woven fabrics and manufactured fibrous goods.

## WEEKLY LIST OF PATENTS SEALED.

[*From Gazette, Dec.* 24, 1858.]

*December 24th.*

1442. S. Whitehall.
1447. E. Pinchon and W. R. Harris.
1448. E. E. d'Heurle.
1451. I. Hammond.
1460. B. Young and P. Brown.
1472. B. Nicoll.
1482. W. T. Smith.
1491. J. L. Clark.
1501. Oliver Sarony.
1512. J. Greenwood.
1542. M. Scott.
1556. J. B. Watson and V. B. Fadeuilhe.
1565. N. Defries.
1618. W. A. Lloyd and E. Edwards.
1822. M. Moses.
2083. J. Luis.
2368. E. C. Shepard.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, Dec.* 24, 1858.]

*December 20th.*

2893. C. J. Appleton.

*December 21st.*

2909. J. Chesterman.
2932. J. Grist.

[*From Gazette, Dec.* 28, 1857.]

*December 23rd.*

2917. R. A. Brooman.
2919. A. Tolhausen.
2931. J. E. Cook.
2934. J. Robinson, R. Cunliffe, and J. A. Collet.
2936. T. F. Uttley.
2950. T. Holmes.

*December 24th.*

2951. W. E. Newton.
9. W. Bullough.

## WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

| No. in the Register. | Date of Registration. | Title. | Proprietors' Name. | Address. |
|---|---|---|---|---|
| 4143 | Dec. 27. | Portable Stereoscopic Camera | J. H. Powell | 121, Newgate-street, E.C. |
| 4144 | ,, 28. | Steam Pumping Engine | T. Cowburn | Manchester. |